


- S1: (68369) "455"/\$.ccls.
- S2: (4) S1 and "programunable linear receiver"
- S3: (1) S2 and "jammer detector"

<p>(11) <b>United States Patent</b> Czernetzki et al.</p>	<p>(16) Patent No.: <b>US 6,496,926 B1</b> (17) Date of Patent: <b>Dec. 24, 2002</b></p>
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 US2002-049720B1

<p>(21) <b>PROGRAMMABLE LINEAR RECEIVERS HAVING A VARIABLE REF POINT</b></p> <p>(35) Invention of: <b>Baron C. Czernetzki, Escondido, CA (US); Ralph E. Kaufman, Los Angeles, CA (US)</b></p> <p>(51) Int. Cl. (7): <b>H03L 0001/00</b></p> <p>(52) U.S. Cl. (1): <b>325/328; 325/329; 325/330; 325/331; 325/332; 325/333; 325/334; 325/335; 325/336; 325/337; 325/338; 325/339; 325/340; 325/341; 325/342; 325/343; 325/344; 325/345; 325/346; 325/347; 325/348; 325/349; 325/350; 325/351; 325/352; 325/353; 325/354; 325/355; 325/356; 325/357; 325/358; 325/359; 325/360; 325/361; 325/362; 325/363; 325/364; 325/365; 325/366; 325/367; 325/368; 325/369; 325/370; 325/371; 325/372; 325/373; 325/374; 325/375; 325/376; 325/377; 325/378; 325/379; 325/380; 325/381; 325/382; 325/383; 325/384; 325/385; 325/386; 325/387; 325/388; 325/389; 325/390; 325/391; 325/392; 325/393; 325/394; 325/395; 325/396; 325/397; 325/398; 325/399; 325/400; 325/401; 325/402; 325/403; 325/404; 325/405; 325/406; 325/407; 325/408; 325/409; 325/410; 325/411; 325/412; 325/413; 325/414; 325/415; 325/416; 325/417; 325/418; 325/419; 325/420; 325/421; 325/422; 325/423; 325/424; 325/425; 325/426; 325/427; 325/428; 325/429; 325/430; 325/431; 325/432; 325/433; 325/434; 325/435; 325/436; 325/437; 325/438; 325/439; 325/440; 325/441; 325/442; 325/443; 325/444; 325/445; 325/446; 325/447; 325/448; 325/449; 325/450; 325/451; 325/452; 325/453; 325/454; 325/455; 325/456; 325/457; 325/458; 325/459; 325/460; 325/461; 325/462; 325/463; 325/464; 325/465; 325/466; 325/467; 325/468; 325/469; 325/470; 325/471; 325/472; 325/473; 325/474; 325/475; 325/476; 325/477; 325/478; 325/479; 325/480; 325/481; 325/482; 325/483; 325/484; 325/485; 325/486; 325/487; 325/488; 325/489; 325/490; 325/491; 325/492; 325/493; 325/494; 325/495; 325/496; 325/497; 325/498; 325/499; 325/500; 325/501; 325/502; 325/503; 325/504; 325/505; 325/506; 325/507; 325/508; 325/509; 325/510; 325/511; 325/512; 325/513; 325/514; 325/515; 325/516; 325/517; 325/518; 325/519; 325/520; 325/521; 325/522; 325/523; 325/524; 325/525; 325/526; 325/527; 325/528; 325/529; 325/530; 325/531; 325/532; 325/533; 325/534; 325/535; 325/536; 325/537; 325/538; 325/539; 325/540; 325/541; 325/542; 325/543; 325/544; 325/545; 325/546; 325/547; 325/548; 325/549; 325/550; 325/551; 325/552; 325/553; 325/554; 325/555; 325/556; 325/557; 325/558; 325/559; 325/560; 325/561; 325/562; 325/563; 325/564; 325/565; 325/566; 325/567; 325/568; 325/569; 325/570; 325/571; 325/572; 325/573; 325/574; 325/575; 325/576; 325/577; 325/578; 325/579; 325/580; 325/581; 325/582; 325/583; 325/584; 325/585; 325/586; 325/587; 325/588; 325/589; 325/590; 325/591; 325/592; 325/593; 325/594; 325/595; 325/596; 325/597; 325/598; 325/599; 325/600; 325/601; 325/602; 325/603; 325/604; 325/605; 325/606; 325/607; 325/608; 325/609; 325/610; 325/611; 325/612; 325/613; 325/614; 325/615; 325/616; 325/617; 325/618; 325/619; 325/620; 325/621; 325/622; 325/623; 325/624; 325/625; 325/626; 325/627; 325/628; 325/629; 325/630; 325/631; 325/632; 325/633; 325/634; 325/635; 325/636; 325/637; 325/638; 325/639; 325/640; 325/641; 325/642; 325/643; 325/644; 325/645; 325/646; 325/647; 325/648; 325/649; 325/650; 325/651; 325/652; 325/653; 325/654; 325/655; 325/656; 325/657; 325/658; 325/659; 325/660; 325/661; 325/662; 325/663; 325/664; 325/665; 325/666; 325/667; 325/668; 325/669; 325/670; 325/671; 325/672; 325/673; 325/674; 325/675; 325/676; 325/677; 325/678; 325/679; 325/680; 325/681; 325/682; 325/683; 325/684; 325/685; 325/686; 325/687; 325/688; 325/689; 325/690; 325/691; 325/692; 325/693; 325/694; 325/695; 325/696; 325/697; 325/698; 325/699; 325/700; 325/701; 325/702; 325/703; 325/704; 325/705; 325/706; 325/707; 325/708; 325/709; 325/710; 325/711; 325/712; 325/713; 325/714; 325/715; 325/716; 325/717; 325/718; 325/719; 325/720; 325/721; 325/722; 325/723; 325/724; 325/725; 325/726; 325/727; 325/728; 325/729; 325/730; 325/731; 325/732; 325/733; 325/734; 325/735; 325/736; 325/737; 325/738; 325</b></p>
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	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current	Ref	Inventor
3	<input type="checkbox"/>	<input type="checkbox"/>	US 6175279 B1	20010116	25	Amplifier with adjustable bias current	330/296	330/285		Ciccarelli; Steven C. et al.
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6134430 A	20001017	28	Programmable dynamic range receiver with adjustable dynamic range analog to digit	455/340	455/232.1; 455/254; 455/337		Younis; Saed G. et al.

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Active

L1: (10) (jamm\$3 near3 detect\$3) and "linear receiver"

L2: (9) 1 and RF

L3: (0) 2 and (LPF and BPF)

L4: (1) 2 and (LPF or BPF)

L6: (5) (jamm\$3 near3 detect\$3) and "programmable linear receiver"

L7: (10) (jamm\$3 near3 detect\$3) and "linear receiver"

L8: (9) 7 and RF

L9: (8) 8 and ("ADC" or "A/D")

L10: (5) 9 and mixer

L11: (5) 10 and filter

L12: (5) 11 and oscillator

L13: (5) 12 and amplifier

L14: (4) 13 and attenuator

L15: (4) 14 and bit

L17: (4) 15 and threshold

L18: (1) 17 and timer

L19: (4) 17 and "power control"

L20: (4) 19 and tim\$3

L21: (1) 20 and IC

L22: (4) 20 and chip

L23: (4) 22 and (detect\$3 near8 jamm\$3)

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SI: (68260) "455"/\$ cals

United States Patent (19)

US6134430A

Younis et al.

Patent Number: 6,134,430

Date of Patent: Oct. 17, 2000

PROGRAMMABLE DYNAMIC RANGE RECEIVER WITH ADJUSTABLE DYNAMIC RANGE ANALOG TO DIGITAL CONVERTER

Inventors: Saad G. Younis, 12767 Redan Ridge Ct., San Diego, Calif. 92130; Seyfollah S. Beharvand, 15260 Overton Rd., San Diego, Calif. 92130; Steven C. Ciccarelli, 714 Summers Lane, Encinitas, Calif. 92024

(21) Appl. No. 08/997,853

(22) Filed: Dec. 6, 1997

(51) Int. Cl.<sup>7</sup> H04B 1/38

(52) U.S. Cl. 455/340; 455/254; 455/233.1; 455/337

(58) Field of Search: 455/233.1, 234.1, 455/243.3, 245.1, 254, 257, 264, 337, 350, 360, 541/245, 136, 179

References Cited

U.S. PATENT DOCUMENTS

5,811,331 8/1999 Pomeroy

Abstract

A programmable dynamic range receiver which provides the requisite level of performance at reduced power consumption. The EA ADC within the receiver is designed with one or more levels. Each level provides a predetermined dynamic range performance. The input can be switched to disabled based on the required dynamic range and a set of dynamic range thresholds. The EA ADC is then designed with a programmable bias current. The dynamic range of the EA ADC is approximately proportional to the bias current. By adjusting the bias current, the required dynamic range can be provided by the EA ADC with minimal power consumption. A dynamic range of the EA ADC can be disabled when high dynamic range is not required, thereby allowing the low bias current in the EA ADC and supporting circuitry. The dynamic range of the EA ADC is a function of the oversampling rate which is proportional to the sampling frequency. High dynamic range requires a high oversampling rate. When high dynamic range is not required, the sampling frequency can be lowered.

22 Claims, 14 Drawing Sheets

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	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current	Ret	Inventor
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 6134430 A	20001017	28	Programmable dynamic range receiver with adjustable dynamic range analog to digit	455/340	455/232.1; 455/254; 455/337		Younis; Saad G. et al

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- ☞ L6: (5) (jamm\$3 near3 detect\$3) and "programmable linear receiver"
- ☞ L7: (10) (jamm\$3 near3 detect\$3) and "linear receiver"
- ☞ L8: (9) 7 and RF
- ☞ L9: (8) 8 and ("ADC" or "A/D")
- ☞ L10: (5) 9 and mixer
- ☞ L11: (5) 10 and filter
- ☞ L12: (5) 11 and oscillator
- ☞ L13: (5) 12 and amplifier
- ☞ L14: (4) 13 and attenuator
- ☞ L15: (4) 14 and bit
- ☞ L17: (4) 15 and threshold
- ☞ L18: (1) 17 and timer
- ☞ L19: (4) 17 and "power control"
- ☞ L20: (4) 19 and tim\$3

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19 and tim\$3

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	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current	Ref	Inventor
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6498926 B1	20021224	26	Programmable linear receiver having a variable IIP3 point	455/240.1	330/129; 455/234.1; 455/239.1;		Ciccarelli, Steven C. al.
3	<input type="checkbox"/>	<input type="checkbox"/>	US 6175279 B1	20010116	25	Amplifier with adjustable bias current	330/296	330/285		Ciccarelli, Steven C. al.
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- 📧 Drafts
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  - 📧 L1: (68369) "455"/\$.cccls.
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  - 📧 L3: (1) 2 and "jammer detector"
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  - 📧 L5: (5) (jamm\$3 near3 detect\$3) and "programmable linear receiver"
  - 📧 L6: (10) (jamm\$3 near3 detect\$3) and "linear receiver"
  - 📧 L7: (6) 6 and mixer
  - 📧 L8: (5) 7 and RF
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1	<input type="checkbox"/>	<input type="checkbox"/>	US 6498926 B1	20021224	26	Programmable linear receiver having a variable IIP3 point	455/240.1	330/129; 455/234.1;		Ciccarelli, Steven C. et al.	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	US 5361072 A	19941101	19	Gated FMCW DF radar and signal processing for range/doppler/angle de	342/133	342/175; 342/196;		Barrick, Donald E. et al.	<input checked="" type="checkbox"/>

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**Drafts**

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7 and RF

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	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current X	Retr	Inventor	S
1	<input type="checkbox"/>	<input type="checkbox"/>	US 20040142670 A1	20040722	15	Dynamically programmable receiver	455/214			Ciccarelli, Steven C.	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6498926 B1	20021224	26	Programmable linear receiver having a variable IIP3 point	455/240.1	330/129; 455/234.1;		Ciccarelli, Steven C. et al.	<input checked="" type="checkbox"/>
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